

## Press Release

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### **Voith transports 170-metric-ton spherical valve to Europe's largest variable-speed pumped-storage plant in Portugal**

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Heidenheim/Vieira do Minho. In mid-May 2015, Voith Hydro successfully transported a 170-metric-ton spherical valve from Shanghai to the new Frades II pumped-storage plant in northwestern Portugal. The component, which was fabricated in Asia, was shipped via Rotterdam to the Portuguese port of Leixeos and transported from there to its destination by a special truck. "Our biggest challenge in getting a just-in-time delivery of such a large component in the first place was coordinating the interfaces between the various carriers and everyone else involved in the transport on the journey from China to Europe. The transport time as such was around eight weeks in the end as planned, but the preparation took much longer," says Stephan Pfeuffer, Head of Shipping at Voith Hydro Heidenheim.

During the two-day journey over Portugal's roads, the 40-meter-long and five-meter-high special load had to negotiate obstacles like narrow winding roads and low bridges. Due to driving conditions, the transport could only move on with walking speed for the last 25 kilometers. "That only works with detailed planning and close consultation with the freight company and local authorities. Ultimately, the success of the transport operation hangs on just a few centimeters," continues Stephan Pfeuffer.

As well as the spherical valve, Voith is also supplying the plant with two variable-speed, reversible 390-MW-pump turbine units, two asynchronous motor generators, each with a rated output of 440 MVA, the frequency converter and control technology as well as hydraulic steel components.

The system is set to go on stream this year to become the largest variable-speed pumped-storage power plant on the continent.

### Variable speed pump turbines

The variable speed pump turbines are what make Frades II special. Because of the variable speed the pump output can also be adjusted, resulting in additional flexibility in the amount of electricity taken from the grid in the event of excess capacity. And it is precisely this combination of electricity storage and variable pump output that is crucial to the ongoing expansion of wind power. Frades II will be installed in an underground cavern, with a height difference between upper and lower reservoirs of 420 meters.

### Portugal is banking on renewable energies

For electricity generation, Portugal is relying primarily on wind, solar and hydropower. Since the turn of the millennium, the country has multiplied its capacities for electricity generation from wind power. In 1998 Portugal had just 51 MW of installed capacity in wind turbine facilities; just 12 years later this had risen to 3,702 MW, and there are plans to extend capacity to 5,400 MW. High-capacity pumped storage plants form the backbone for the further expansion of power generation from renewable energy sources. Almost 42% of renewable energy in Portugal comes from hydropower.

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